Where's the wildlife?

by John Morton

I'm sure there are times when you must wonder where the wildlife is on the Kenai Refuge. This kind of thought might hit you as you're hunting for caribou, paddling through the canoe system, birding along the Skyline trail, or simply driving down the Sterling Highway looking for moose to show visiting relatives.

Professional wildlife biologists spend a lot of time trying to answer exactly this kind of question. Typically, we either census a population or sample a population. A census is a count of all the individuals in a given area. On the Refuge, we conduct annual aerial surveys to locate and count all bald eagle and trumpeter swan nests. These nests are relatively easy to spot from the air, and both species have high "site tenacity," meaning that they nest in the same general area year after year.

We can census large animals that move around in groups by cheating a little. Working with Alaska Department of Fish and Game biologists, we put radio transmitters on a few animals within a caribou herd or a wolf pack. Having these "Judas" individuals to betray the location of a herd or pack allows us to get a complete count from a Cessna. That's how we know that we have 1,100 caribou in four herds (or did, before a series of mortality-causing avalanches).

We also sample populations. This approach is similar to what the Gallup Organization uses to poll us about who we're going to vote for in the upcoming presidential elections. We develop a statistical sampling design that allows us to extrapolate population estimates from a much smaller sample to the 2-million acre Refuge. Again, working with our interagency partners, we fly aerial surveys to count moose along transects or wolverines within nine-square mile plots. That's how we know that there are 5,000 moose on the Refuge, give or take a few.

Over the years, these methods have been refined so that they give us reasonably accurate counts of these species and tell us something about their distribution. However, under the Alaska National Interest Lands Conservation Act of 1980, the Refuge is mandated "to conserve fish and wildlife populations and habitats in their natural diversity". But it's difficult to fulfill our mandate if we don't know what constitutes natural diversity on the Kenai. This is a pretty tall order given that we have something like 200 vertebrate species and over 300 vascular plant species on the Refuge! There just aren't enough biologists for that workload using conventional methods of inventorying and monitoring.

So we've had to come up with a new way. Rather than following animals as they move across the landscape, we sample a plot of land to see what moves across it. Our plots are distributed on a grid across the Refuge at 3-mile intervals. This past summer, we sampled breeding land birds (70 or so species) and vascular plants on 150 points (every other point) on the grid. Although we measured bird densities and habitat structure at each point, the primary purpose of this surveying method is to determine presence or absence of each bird species.

By doing this in a systematic manner, we are able to use a statistical technique called logistic regression to model the probability of a species occurring at a point, given some information about the habitat there (basically topography and vegetation). We then use the analytical capabilities of our Geographic Information System to apply the regression equation to digital pixels that code habitat data. The result is a map that shows the distribution of a species across 2 million acres, such as the accompanying map for Savannah Sparrows. We can now do this for several dozen bird species, and plan to extend the method to various mammals, plants and insects in future surveys.

Not only is this a pretty cool use of technology, statistics and biology, it's fairly cost effective. Through a memorandum of understanding that we've signed with the U.S. Forest Service's Forest Inventory & Analysis program, we survey the wildlife and they survey the forest vegetation.

In the near future, we expect to determine the winter distribution of snowshoe hares, wolves, and other winter mammals on the grid by using aerial digital videotaping. We also expect to sample the distribution of hundreds of aerial insect species by deploying tent traps on the grid. Ask a Refuge biologist, "Where's the wildlife?" and we might be able to give you better answer in the coming years.

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